surface region 44, there being additionally shown a permanent magnet rotor 46 that has been adhered to rotor surface region 44 by an adhesive 45. Working surface region 42 is shown in this specific illustrative embodiment of the invention to have a continuous helical groove 50 that is formed of multiple cutting passes using a cutter device, such as cutter tool 35 shown in Fig. 4. In the practice of a method aspect of the invention, the very first cutting pass is not limited to the working surface region of motor shaft 40, but instead is continued along rotor surface region 44 to form a shallow continuous helical groove 51. Continuous helical groove 51 is similar to continuous helical groove 33 described above with respect to Figs. 3 and 4.

REMARKS

Amendments are presented herein to improve the form of the subject application and in response to the Examiner's comments in the above-identified Office Action.

Status of the Claims

Claims 1-13 were originally filed.

Claims 1-9 and 13 were canceled as non-elected.

Claims 10-12 were present in the case during the examination that resulted in the present action.

Claims 10-12 remain in the case.

Information Disclosure Statement

The Examiner states that the Information Disclosure Statement filed 02/24/2002 is "partial" and therefore the Examiner did not consider references AC and AD because, according to the Examiner, the Information Disclosure Statement fails to comply with 37 C.F.R. §1.98(a)(2), which

requires a legible copy of each U.S. and foreign patent; each publication or that portion that caused it to be listed; and all other information or that portion that caused it to be listed. The Examiner states that the Information Disclosure Statement has been placed in the application file, but the information referred to therein has not been considered.

Applicant respectfully notes that references AC and AD are but English language abstracts that were attached by the European Examiner to respectively associated ones of references AA and AB. Accordingly, the information in references AC and AD was considered by the Examiner during consideration of references AA and AB.

Drawings

The drawings are deemed by the Examiner to be objectionable under 37 C.F.R. §1.83(a). The Examiner states that the drawings must show every feature of the invention specified in the claims. Therefore, the Examiner considers that the "permanent magnet" and "an adhesive" must be shown or the feature(s) canceled from the claim(s). The Examiner cautions that no new matter should be entered.

The Examiner states that a proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application, and that the objection to the drawings will not be held in abeyance.

With respect to the "permanent magnet" identified by the Examiner, it is respectfully asserted that this element of structure is adequately represented in the drawing and specification. In this regard, the Examiner's attention is respectfully directed to Fig. 5, element 46, which is described in the specification at page 7, lines 20 to 23, as follows: *Fig. 5 is an isometric presentation of a motor shaft 40 constructed in accordance with the invention showing a working surface region 42 and a*

rotor surface region 44, there being additionally shown a permanent magnet rotor 46 that has been adhered to rotor surface region 44.

With respect to "an adhesive," Applicant has amended Fig. 5 to illustrate an adhesive schematically. This does not constitute new matter, as the adhesive element has been present in the specification and claims since the time the case was filed. In this regard, please see the specification, for example, at page 1, lines 12-13, 17-19, and 23-24; page 2, lines 2 and 6; page 4, line 1, 7-8, and 9-10; page 5, lines 6-8; page 8, lines 7-9 and 13-15; and claims 7-10.

Applicant has amended the specification to make reference to the amendment to the drawing. This amendment to the specification does not add any new matter to the case for the reasons set forth hereinabove.

Specification

The disclosure is considered by the Examiner to be objectionable because of the following informality: in page 3, line 5, the phase "the method of claim 1" should be removed.

Appropriate correction is required by the Examiner.

The Examiner states that the specification has not been checked to the extent necessary to determine the presence of all possible minor errors. The Examiner requests Applicant's cooperation in correcting any errors of which Applicant may become aware in the specification.

Applicant has amended the specification in the portion thereof identified by the Examiner to delete the language that the Examiner deems objectionable. It is respectfully asserted that the Examiner's objection to the specification has been overcome

Claim Rejections- 35 U.S.C. §102

CLAIMS 10-12

Claims 10-12 stand rejected under 35 U.S.C. § 102(b) as specifying subject matter considered by the Examiner to be anticipated by Ozawa, *et al.* (JP409219946A).

Regarding claim 10, the Examiner states that the Ozawa, *et al.* reference discloses a rotor (31, Fig. 10) for a permanent magnet motor, the rotor comprising: a rotor shaft having: a working region (see, region 34) for delivering mechanical energy; and a rotor region (see, region 34e) arranged coaxially with said working region, said rotor region having a rotor region surface having a rotor region surface cut (34e) therein; and a permanent magnet (33) arrangement coupled by an adhesive to said rotor region of said rotor shaft for facilitating conversion of electromagnetic energy to mechanical energy, adhesion (14) between said permanent magnet arrangement and the rotor region surface being enhanced by the rotor region surface cut.

Regarding claim 10, the Examiner considers that the Ozawa, *et al.* reference discloses that the rotor region surface cut is a continuation of a working surface region cut.

Regarding claim 10, the Examiner considers that the Ozawa, *et al.* reference discloses that the working region of said rotor shaft has a threaded potion, and the working region surface cut is a first cut pass of the threaded portion of the working region of said rotor shaft.

APPLICANT'S RESPONSE

Applicant has amended the claims to specify subject matter that is not taught or suggested by the references of record. More specifically, independent claim 1 has been amended to specify that *the continuous helical cut along the working and rotor surface regions of the precision shaft has a depth of approximately between 0.001" and 0.004" into the rotor surface region.*

The Ozawa, *et al.* reference does not teach this important aspect of the present invention. It is, of course, understood that the Ozawa, *et al.* reference is written in a foreign language and therefore not entirely understandable to Applicant or his representative. Nevertheless, careful examination of the drawings in the Ozawa, *et al.* reference reveals that the helical cut, such as in Figs. 9 and 10 of the reference, as well as the annular cut of Fig. 8, are all as deep as the thread cuts in the working region of shafts 34 and 35. The Ozawa, *et al.* reference does not even suggest the limited depth of the cut in the rotor region of the shaft of the present invention.

It is believed that the inventor of the subject matter of the Ozawa, *et al.* reference would not use the shallow helical cut of the present invention because such would not be effective to the pouring of epoxy into the groove. In addition, reference is made to Fig. 1 of the Ozawa, *et al.* reference where it is shown that portions of the rotor assembly extend radially inward to engage with the deep grooves (4b and 4c) of the rotor region of the shaft (4). The security of affixation of the rotor to the shaft that is achieved in the Ozawa, *et al.* reference by use of the deep grooves cannot be achieved with the shallow cuts made in accordance with the claimed invention. Accordingly, those who would seek to achieve the affixation security of the rotor in the Ozawa, *et al.* reference would not consider the shallow cuts in the rotor region of the shaft of the present invention.

In addition, it is believed that the deep groove arrangement described in the Ozawa, *et al.* reference cannot achieve the benefits of the present invention. First, it is evident that the shallow cut of the present invention will reduce the amount of adhesive that is required to join the shaft to the permanent rotor. Moreover, the shallow cut will leave a larger portion of the surface of the shaft in communication with the internal surface of the permanent magnet rotor. Finally, the shallow cut of the present invention will reduce the thickness of adhesive required within the groove to communicate with the permanent magnet rotor, thereby forming a stronger bond.

In view of the foregoing, it is respectfully asserted that the Examiner's rejection of claims 10-12 under 35 U.S.C. § 102(b) has been overcome, and claims 10-12 are therefore in allowable condition.

Conclusion

It is respectfully requested that the Examiner reconsider the present application, allow the claims, and pass the application for issue. If the Examiner believes that the prosecution of this case can be expedited by a telephone interview, the Examiner is requested to call attorney for Applicant at the telephone number indicated hereinbelow.

Respectfully submitted,

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RAM:rb:ROA.BV3
Enc Amended Fig. 5 (sketch)
Amended Fig. 5 (corrected)

Annexure 1 - Claims Rewritten to Show Amendments

Please amend claim 10 as follows:

10. (Amended) A rotor for a permanent magnet motor, the rotor comprising:

a rotor shaft having:

a working region for delivering mechanical energy; and

a rotor region arranged coaxially with said working region, said rotor region having a rotor region surface having a rotor region continuous helical surface cut therein, the continuous helical cut having a depth of approximately between 0.001" and 0.004" into the rotor surface region; and

a permanent magnet arrangement coupled by an adhesive to said rotor region of said rotor shaft for facilitating conversion of electromagnetic energy to mechanical energy, adhesion between said permanent magnet arrangement and the rotor region surface being enhanced by the rotor region continuous helical surface cut.

Annexure 2 - Specification Rewritten to Show Amendments

Please amend the first and second paragraphs of page 3, lines 1 to 8, as follows:

third preparing the working region of the precision shaft using the cutting tool, the step of third preparing including at least a second cutting pass by the cutting tool into the working surface region of the precision shaft, [.

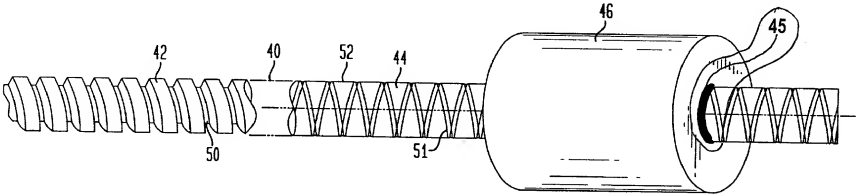
The method of claim 1,] wherein the steps of first preparing the working surface region of the precision shaft and second preparing the rotor surface region of the precision shaft include the step of forming a continuous helical cut along the working and rotor surface regions of the precision shaft, whereby an inter-helix region of the rotor surface region of the precision shaft retains the first predetermined cross-sectional diameter.

Please amend the paragraph on page 7, line 20 to page 8, line 6, as follows:

Fig. 5 is an isometric presentation of a motor shaft 40 constructed in accordance with the invention showing a working surface region 42 and a rotor surface region 44, there being additionally shown a permanent magnet rotor 46 that has been adhered to rotor surface region 44 by an adhesive 45. Working surface region 42 is shown in this specific illustrative embodiment of the invention to have a continuous helical groove 50 that is formed of multiple cutting passes using a cutter device, such as cutter tool 35 shown in Fig. 4. In the practice of a method aspect of

the invention, the very first cutting pass is not limited to the working surface region of motor shaft 40, but instead is continued along rotor surface region 44 to form a shallow continuous helical groove 51. Continuous helical groove 51 is similar to continuous helical groove 33 described above with respect to Figs. 3 and 4.

FIG. 5



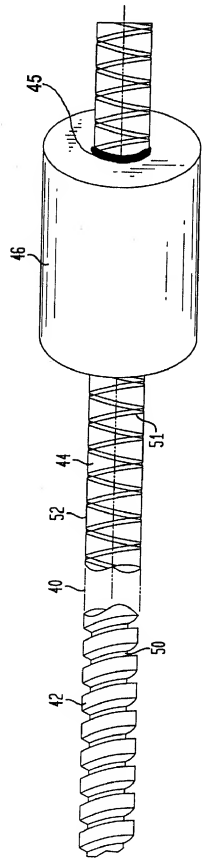


FIG. 5